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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A process for producing acrylic acid, comprising the steps of:

a) vaporizing a raw material comprising an aqueous glycerol solution to generate a first gas, wherein said aqueous glycerol solution has a water content of not more than 20% by weight;

b) applying a dehydration reaction to glycerol in a gas phase that includes said first gas; and then

c) applying a gas phase oxidation reaction to a gaseous reaction product formed by the dehydration reaction to obtain said acrylic acid; and

d) conducting the dehydration reaction and the gas phase oxidation reaction in a single-type reactor comprising one reaction tube, where said one reaction tube is filled with catalysts for the dehydration reaction and for the gas phase oxidation reaction uniformly mixed together or with a catalyst which functions both for the dehydration reaction and the gas phase oxidation reaction, thus conducting the dehydration reaction and the gas phase oxidation reaction in said one reaction tube at the same time.

2-5. (canceled).

6. (previously presented) The process for producing acrylic acid according to claim 1, and further comprising the steps of:

a) adding an inert gas to the first gas to obtain a

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resultant mixed gas, wherein the inert gas is selected from the group consisting of nitrogen gas, carbon dioxide gas and rare gas; and

b) controlling a concentration of said inert gas in said resultant mixed gas to a concentration of not less than 50% by volume.

7. (previously presented) The process for producing acrylic acid according to claim 1, wherein the gas phase in which the dehydration reaction is conducted is a mixed gas comprising glycerol, water vapor and oxygen.

8. (previously presented) The process for producing acrylic acid according to claim 7, wherein the amount of the water vapor relative to the glycerol in the mixed gas is not larger than 1.2 times by mol.

9. (previously presented) The process for producing acrylic acid according to claim 1, wherein the acrylic acid is used to produce a water-absorbent resin.

10. (canceled).

11. (previously presented--withdrawn) A water-absorbent resin produced from acrylic acid obtained by the process for producing acrylic acid according to claim 1.

12. (previously presented) The process for producing acrylic acid according to claim 1, further comprising the step of collecting the resultant acrylic acid as a solution by using water or a solvent.

13. (previously presented) The process for producing

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acrylic acid according to claim 12, further comprising a distillation step for removing low- and high-boiling-point materials from the resultant solution containing acrylic acid.

14. (previously presented) The process for producing acrylic acid according to claim 12, further comprising a crystallization step for purifying acrylic acid by crystallizing it.

15. (currently amended) A petroleum independent process for producing acrylic acid, comprising the steps of:

a) obtaining glycerol from one of i) hydrolysis of oils-and-fats, ii) waste fluids in soap production, and iii) a by-product in production of a bio-diesel fuel as a renewable fuel;

b) vaporizing a raw material comprising an aqueous glycerol solution having said glycerol to generate a first gas, wherein said aqueous glycerol solution has a water content of not more than 20% by weight;

c) adding an inert gas to the first gas to obtain a resultant mixed gas, wherein the inert gas is selected from the group consisting of nitrogen gas, carbon dioxide gas and rare gas, and controlling a concentration of said inert gas in said resultant mixed gas to a concentration of not less than 50% by volume;

d) applying a dehydration reaction to glycerol in a gas phase that includes said resultant mixed gas, wherein the gas phase in which said dehydration reaction is conducted comprises glycerol, water vapor and oxygen, and wherein the amount of the water vapor relative to the glycerol in the mixed gas is not larger than 1.2 times by mol; ~~and then~~

e) applying a gas phase oxidation reaction to a gaseous

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reaction product formed by the dehydration reaction to obtain said acrylic acid; and

f) conducting the dehydration reaction and the gas phase oxidation reaction in a single-type reactor comprising one reaction tube, where said one reaction tube is filled with catalysts for the dehydration reaction and for the gas phase oxidation reaction uniformly mixed together or with a catalyst which functions both for the dehydration reaction and the gas phase oxidation reaction, thus conducting the dehydration reaction and the gas phase oxidation reaction in said one reaction tube at the same time.

16. (previously presented--withdrawn) A process for producing a water-absorbent resin from glycerol as a raw material, comprising the steps of: producing acrylic acid from glycerol as a raw material by the process according to any one of claims 1 and 15; and then polymerizing said acrylic acid to obtain a water-absorbent resin.

17. (previously presented--withdrawn) A process for producing a water-absorbent resin from acrylic acid as a raw material, comprising the step of polymerizing acrylic acid as a raw material to obtain a water-absorbent resin, wherein said acrylic acid is acrylic acid obtained by the process according to any one of claims 1 and 15.